www.sospublication.co.in Journal of Advanced Laboratory Research in Biology

We- together to save yourself society e-ISSN 0976-7614

Volume 2, Issue 4, October 2011 Research Article

Effect of Anaerobically Digested Slurry of Cow Dung and Kitchen Waste on the Seed Quality in Okra (*Abelmoschus esculentus* L.)

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Abstract: The present study was carried out to see the effect of anaerobically digested slurry of cow dung and kitchen waste on the seed quality parameters in Okra (*Abelmoschus esculentus* L.). The seeds were treated with both cow dung slurry and kitchen waste slurry (100% and diluted to 50% with H_2O) and kept for different time durations (6 hours and 18 hours). The seed germination was increased when the kitchen waste slurry was diluted to 50% and kept for 6 hours during daytime. Cow dung slurry when used as such (100%) for 6 hrs increased the percent seed germination and seedling length significantly thus increasing the seed vigour I and II.

Keywords: Cow dung slurry, Kitchen Waste Slurry and Okra.

Traditionally in our villages and rural areas, organic manure is used such as dung of domestic animals. Cow dung shows no or less adverse effect on crops and also on human health. The use of organic manure is better for quality and yield of the crops and increased rapidly since the start of green revolution. The main advantage of the cow dung is that it doesn't pollute the soil and does not give any negative effect to the environment whereas fertilizers, pesticides and chemicals *etc*. all contribute towards soil pollution. The excess amounts of fertilizers affect the soil, the crop characteristics and the product from the crops.

Because of the use of manures, the physical conditions such as aeration and water transmission properties of the soil are improved. Because of slow release of ammoniacal nitrogen and then slow conversion to nitrates, the leaching loss of nitrogen is low in the presence of organic manures. It provides a hygienic and useful way of disposal and utilization of waste. Uses of inorganic fertilizers and pesticides also have residual effect in crop grains. Besides, the cow dung, urine treatment alone or in combination with various plant extracts have also been used to control plant diseases (Akhter *et al*., 2006).

The anaerobically digested slurry is shown not only to produce pathogen free manure, increased fertilizer and biogas but can improve the antimicrobial activity of medicinal plants (Yongabi *et al.*, 2009). Cow dung slurry has also been recently reported to be used as decomposition and mineralization of rice straw (Saha and Hajra, 2007). Biogas slurry has also been used for short-term and long-term benefits in terms of production increments and soil amelioration (Garg *et al*., 2005), cultivation, biochemical quality and production (Fang *et al.*, 2009), spouting of white jam (Suja *et al.*, 2006; Naskar *et al.*, 2003) and germination percentage and speed in artificial regeneration studies (Prashanth and Prakash, 2009).

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Table 1. Effect of anaerobically digested slurry of cow dung and kitchen waste on the seed quality in Okra (*Abelmoschus esculentus* L.).

Treatment	% Germination	Shoot Length cm	Root length cm	Seedling Length cm	Fresh Weight g	Dry Weight g	Seedling Vigour index I	Seedling Vigour index II
Control	80.00	20	12	32	2.212	0.126	2560.0	2.016
				18 hrs				
Hydration	82.50	22	5	27	2.413	0.130	2227.5	2.145
KW 50%	75.00	21	10	31	2.461	0.117	2325.0	1.755
CD 50%	62.50	23	15	38	2.890	0.125	2375.0	1.563
KW 100%	75.00	22	9	31	2.776	0.135	2325.0	2.025
CD 100%	75.00	28	5	33	2.528	0.119	2475.0	1.785
				6hrs				
Hydration	81.50	21	9	30	2.919	0.131	2325.0	2.031
KW 50%	87.50	20	15	35	3.177	0.138	3062.5	2.415
CD 50%	70.00	28	6	34	2.912	0.114	2380.0	1.596
KW 100%	70.00	21	10	31	2.926	0.131	2170.0	1.834
CD 100%	92.50	29	10	39	3.240	0.132	3607.5	2.442

KW 50% - Kitchen waste slurry diluted to 50%; CD 50% - cow dung slurry diluted to 50%; KW 100% - Kitchen waste slurry 100%; CD 100% - cow dung slurry 100%; Seedling Vigour Index I = Germination (%) x (seedling length in cm); Seedling Vigour Index II = Germination (%) x (seedling dry weight in g)

In the tradition of research in organic agriculture, the use of compost and EM (effective microorganisms) have played a central role in plant protection, since these products simultaneously attempt a beneficial microbial soil flora and thereby prevent some plant diseases (Sangakkara *et al*., 1999) and pathogenic fungi (Swain *et al.,* 2008). Furthermore, one of the two negative effects of the seed treatment in often that seed vigour in terms of germination speed is reduced. Low-dose of EM has been shown to improve speed of germination. Fast and even germination is essential for increasing yield potential also in conventional agriculture (Bargen and Mehrnaz, 2000).

Presently the study was carried out to see the effect of anaerobically digested slurry of cow dung and kitchen waste on the seed quality parameters in okra (*Abelmoschus esculentus* L.) (Table 1). The seeds were treated with both cow dung slurry and kitchen waste slurry (100% and diluted to 50% with H_2O) and kept for different time durations (6 hours and 18 hours). After surface drying at room temperature.

For two hours, seeds were analysed for its quality parameters, *viz.*, germination percentage, seedling length and biomass (Anonymous, 1996) and seed vigour I and II (Abdul Baki and Anderson, 1973). The seed germination was increased when the kitchen waste slurry was diluted to 50% for and kept for 6 hours during daytime. Cow dung slurry when used as such (100%) for 6 hrs increased the percent seed germination and seedling length significantly thus increasing the seed vigour I and II. Fresh weight and dry weight was also increased by cow dung slurry. The effect was more when the time period was 6 hrs during the daytime. Earlier studies have also shown to improve the seed germination by the anaerobically fermented cow dung manure in carrot, cucumber and beet *etc,* (Siqueira *et al*., 1993). Thus anaerobically treated slurry of kitchen waste and cow dung can be exploited to improve the seed germination of vegetable crops.

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